missions align closely enough that they can be treated as different aspects of the same unit. The contributors to a particular journal or members of a given professional society will tend to focus on a common domain of inquiry, share a common mission, and employ a similar range of techniques. Network analyses will likewise tend to track scientists who share many of these common characteristics. In the analysis of cell biology in this book, I will be focusing on three of the features of disciplines discussed above – the mission, research methods, and institutions. Together, these resulted in a discipline devoted to the domain of cellular mechanisms.

In the discussion so far I have not considered the generality or specificity of a discipline. Each of the criteria, however, can be applied so as to pick out units that vary considerably in specificity or scope. Focusing just on professional organizations, some (such as the American Association for the Advancement of Science or The Royal Society) attempt to serve the whole of science, others (such as the Biochemical Society and the American Society for Cell Biology) have a more limited scope, and still others focus on specific phenomena (the Protein Society or the RNA Society) or techniques (The Tissue Culture Association or the Electron Microscope Society of America). Though terminology for units at different levels of generality involves very fuzzy, overlapping boundaries, the range from most to least general might be taken to include (1) molar disciplines (e.g., biology, chemistry); (2) operational units called either disciplines or fields[5] (e.g., ecology, cell biology, biochemistry); (3) research areas[6] that focus on particular phenomena within the scope of a discipline (these can be rather slippery; e.g., the research areas of intermediary metabolism and cellular respiration have overlapped in different ways at different times); (4) smaller units that can be delimited by time, space, subdomain, or affinity (e.g., the Institute for Enzyme Research at the University of Wisconsin; (5) finally, the individual investigator or research team.

Several levels in this hierarchy are relevant for understanding the creation of cell biology. At various points I will be focusing on individual scientists and laboratories and will discuss several research areas. But cell biology

[5] In definitions and in actual use, these terms overlap substantially but not completely. For example, disciplines may tend toward greater size or tighter ties to institutional structures than fields. Any such differences need not be adjudicated here.

[6] They are called *research areas* to help distinguish them from the larger fields to which they belong, but are similar in meaning to *research fields* or *scientific specialties*. Historian of science Larry Holmes offered this discerning characterization: "A research field is more than a network of communication and ties of professional interest. It is also an ongoing investigative stream composed of the intersecting investigative pathways of each of the individual scientists (or integrated local research groups) who participate actively at its creative forefront" (1992, p. 7).